

A black and white photograph showing a dense growth of tall, thin grasses or reeds. The plants are silhouetted against a lighter background, possibly water or a cloudy sky. They are growing in a somewhat organized, linear pattern across the frame.

**1971** OPERATING  
SUMMARY

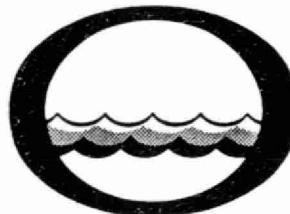
**MIDLAND**  
**WATER POLLUTION CONTROL PLANT**

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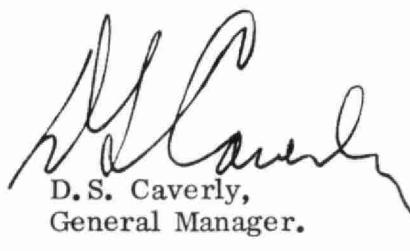


*Water management in Ontario*

Ontario  
Water Resources  
Commission

We are pleased to submit for your consideration a summary of operation during 1971 of the water pollution control plant serving your community.

This operating summary contains parameters normally used to measure plant performance and loading, as well as relevant cost data. Because of the concern over eutrophication of our lakes and of the requirement, in many parts of Ontario, to remove the major contributing factor, results of analysis for phosphorus appear in this summary.



D.S. Caverly,  
General Manager.



D.A. McTavish

P. Eng.,  
Director,  
Division of Plant Operations.

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MIDLAND  
WATER POLLUTION CONTROL PLANT

operated for

THE TOWN OF MIDLAND

by the

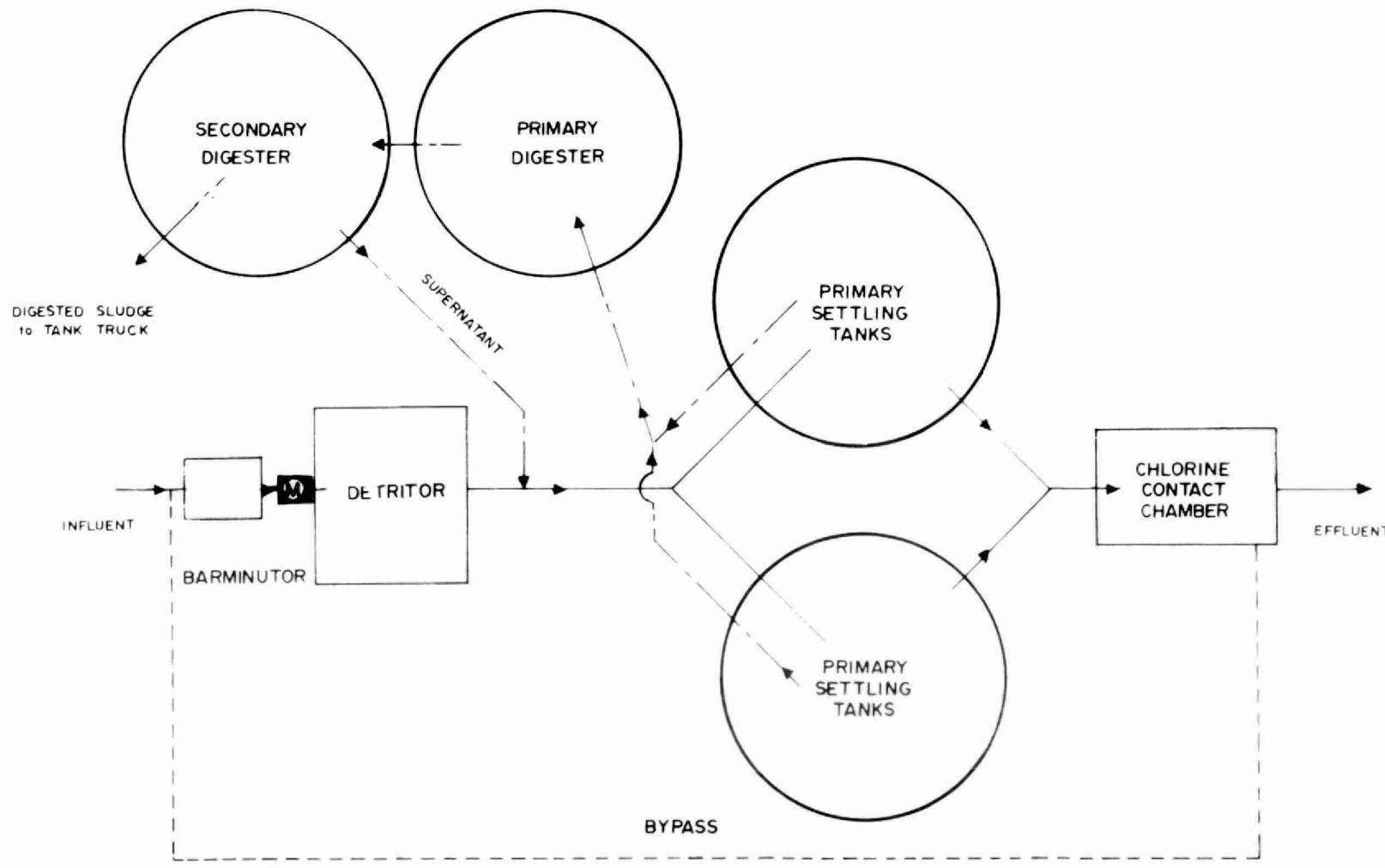
ONTARIO WATER RESOURCES COMMISSION

1971 ANNUAL OPERATING SUMMARY

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MIDLAND  
WATER POLLUTION CONTROL PLANT



## DESIGN DATA

PROJECT NO.	2-0146-63	<u>PRIMARY TREATMENT</u>	<u>SLUDGE HANDLING</u>
TREATMENT	Primary	<u>Comminution</u>	Digestion System - Two Stage
DESIGN FLOW	1.25 mgd	Type: Barminutor Size: One Model C	Primary -- Type: Babcock-Wilson Draft tube mixers (2)
DESIGN POPULATION	12,500	<u>Grit Removal</u>	Size: One 30' dia x 22' (15,600 cu ft or 97,200 gal) Loading: 4.3 lb/cu ft/mo
BOD - Raw Sewage - Removal	225 mg/l 40%	Type: Dorr Detritor Size: One 12' x 12' x 16" (1,200 gal) Retention: 1.38 min	Secondary -- Type: Fixed steel cover Size: One 30' dia x 21½' (15,200 cu ft or 94,600 gal) Total Loading: 2.2 lb/cu ft/mo
SS - Raw Sewage - Removal	300 mg/l 60%	<u>Primary Sedimentation</u>  Type: Dorr Size: Two 50' dia x 8' swd 195,000 gal) Retention: 3.75 hours Loading: Surface, 319 gal/ft <sup>2</sup> /day Weir, 3970 gal/ft/day	<u>PUMPING STATIONS</u>
		<u>CHLORINATION</u>  Type: W & T, Type A711 (Auto) Size: One 1000 lb/day	#1 Pumping Station
		<u>Chlorine Contact Chamber</u>  Size: Irregular (16,200 gal) Retention: 18.7 min	Type: Worthington Size: Two 780 gpm @ 37' tdh One 2600 gpm @ 60' tdh
		<u>OUTFALL</u>  615' of 24" pipe to Georgian Bay	#2 Pumping Station
			Type: Flygt (submersible) Size: Two 83 gpm @ 30' tdh

# '71 Review

## GENERAL

There was a noticeable increase in the average daily flow to the plant during the year. On the average, 72 percent of the daily flow equalled the hydraulic design capacity of the plant.

The average BOD reduction was 10 percent lower than the plant design reduction of 40 percent. The average suspended solids reduction was 6 percent greater than the design value of 60 percent.

The plant won the best plant award in 1971.

## PLANT FLOWS and CHLORINATION

The total estimated flow to the plant was 511.0 million gallons. The average daily flow to the plant was 1.4 million gallons and at various times the plant received raw sewage at a maximum flow rate of 5.1 million gallons per day.

A total of 33,600 pounds of chlorine were used to maintain a residual in the plant effluent of 0.5 mg/l with an average dosage of 6.7 mg/l.

### PLANT EFFICIENCY

The influent BOD and suspended solids were 106 mg/l and 193 mg/l respectively. The effluent contained 74 mg/l BOD and 66 mg/l suspended solids. These results represent an average reduction of 30 percent BOD and 66 percent suspended solids.

Total phosphorous removal averaged 40 percent for the year.

### SLUDGE DIGESTION and DISPOSAL

A total of 1,121,000 gallons of sludge was deposited in the digester from the primary clarifiers. The raw sludge averaged 11.5 percent total solids of which 43 percent were volatile solids. During the year 307,000 gallons of digested sludge were hauled from the digester by a private contractor for disposal on the land. This sludge contained 9.3 percent total solids of which 32 percent were volatile solids.

### CONCLUSIONS

With the increased flows experienced, the plant efficiency was slightly upset. However, with the average daily flows equaling the plant's hydraulic design capacity, 72 percent of the time, steps should be taken in the near future to enlarge the plant capacity.

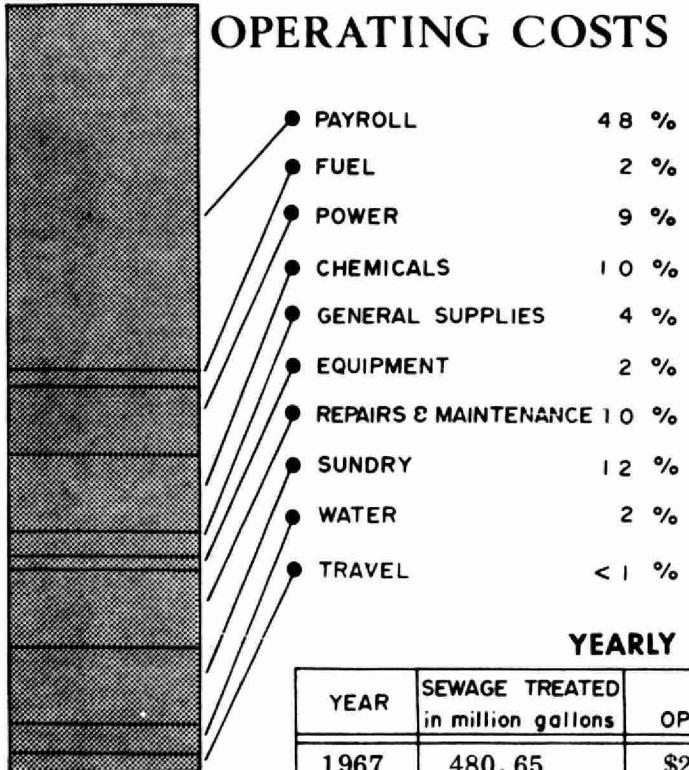
## PROJECT COSTS

NET CAPITAL COST (Final)	\$822, 029. 32
DEDUCT - Portion financed by CMHC/MDLB (Final)	<u>496, 399. 44</u>
Long Term Debt to OWRC	<u>\$325, 629. 88</u>
Debt Retirement Balance at Credit (Sinking Fund) December 31, 1971	\$ <u>48, 912. 32</u>
Net Operating	\$ 37, 868. 34
Debt Retirement	3, 838. 00
Reserve	4, 297. 75
Interest Charged	<u>18, 264. 85</u>
TOTAL	\$ <u>64, 268. 94</u>

### RESERVE ACCOUNT

Balance @ January 1, 1971	\$ 27, 253. 59
Deposited by Municipality	4, 297. 75
Interest Earned	<u>1, 843. 74</u>
	\$ 33, 395. 08
Less Expenditures	<u>1, 451. 80</u>
Balance @ December 31, 1971	\$ <u>31, 943. 28</u>

## OPERATING COSTS



## 1971 COSTS

### TOTAL ANNUAL COST

NET OPERATING  
DEBT RETIREMENT  
RESERVE  
INTEREST

% 59  
% 6  
% 7  
% 28

### YEARLY OPERATING COSTS

YEAR	SEWAGE TREATED in million gallons	TOTAL OPERATING COSTS	TREATMENT COSTS	
			\$ per million gal	¢ per lb BOD
1967	480.65	\$25,872.10	\$53.83	12 cents
1968	497.54	28,281.17	56.84	17 cents
1969	488.0	35,187.35	72.11	26 cents
1970	485.4	34,075.73	70.20	14 cents
1971	511.0	37,863.28	74.10	24 cents

## MONTHLY OPERATING COSTS

MONTH	TOTAL EXPENDITURE	REGULAR PAYROLL	CASUAL PAYROLL	FUEL	POWER	CHEMICALS	GENERAL SUPPLIES	EQUIPMENT	REPAIRS and MAINTENANCE	SUNDY*	WATER	TRAVEL
JAN	1745.15	1262.24	17.42	36.92	304.44	-	112.23	-	-	11.90	-	-
FEB	3093.15	1808.95	-	38.30	332.77	-	117.82	-	410.51	200.25	184.55	-
MAR	4122.72	1193.57	-	237.97	298.59	1352.40	70.57	-	507.07	462.55	-	-
APR	2413.13	1228.60	72.88	82.67	329.60	-	89.97	234.01	37.02	338.38	-	-
MAY	2818.17	1387.78	167.92	53.59	363.36	-	174.75	109.15	103.29	349.17	109.16	-
JUNE	2842.93	819.74	62.16	46.30	272.35	-	253.77	359.97	585.97	430.57	12.10	-
JULY	2192.56	1260.97	93.80	39.86	293.35	-	58.27	-	83.38	362.93	-	-
AUG	2035.22	1337.85	74.84	53.43	265.03	-	60.14	-	221.98	21.95	-	-
SEPT	3726.73	1385.10	54.55	39.86	301.63	-	122.88	2.86	469.14	1345.01	-	5.70
OCT	2754.95	1639.47	58.72	20.13	258.88	53.55	145.93	-	261.52	18.10	298.65	-
NOV	4575.93	2014.29	36.00	35.20	250.63	821.20	75.81	16.20	609.37	621.10	-	96.13
DEC	5542.64	2281.56	36.23	41.41	307.55	1746.00	186.47	-	624.36	316.16	-	2.90
<b>TOTAL</b>	<b>37863.28</b>	<b>17620.12</b>	<b>674.52</b>	<b>725.64</b>	<b>3578.18</b>	<b>3973.15</b>	<b>1468.61</b>	<b>722.19</b>	<b>3913.61</b>	<b>4478.07</b>	<b>604.46</b>	<b>104.73</b>

Brackets indicate credit.

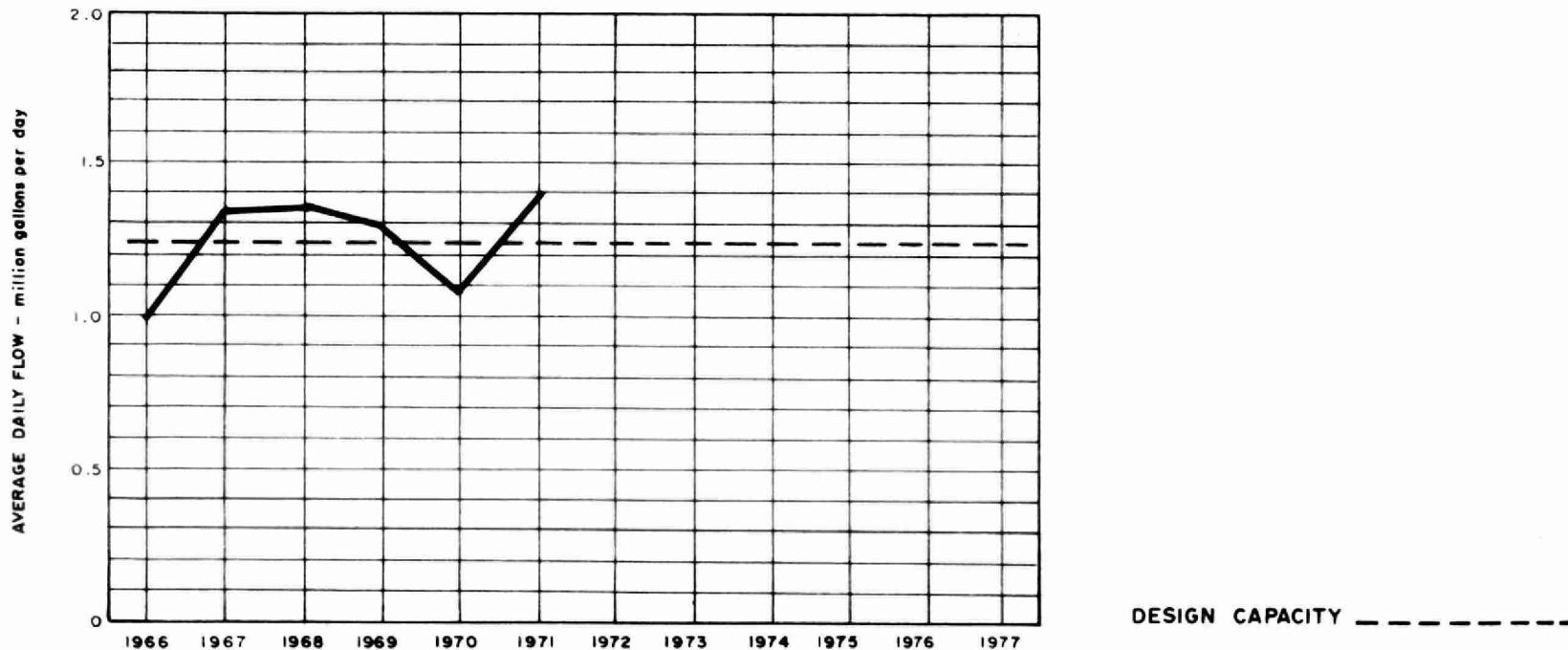
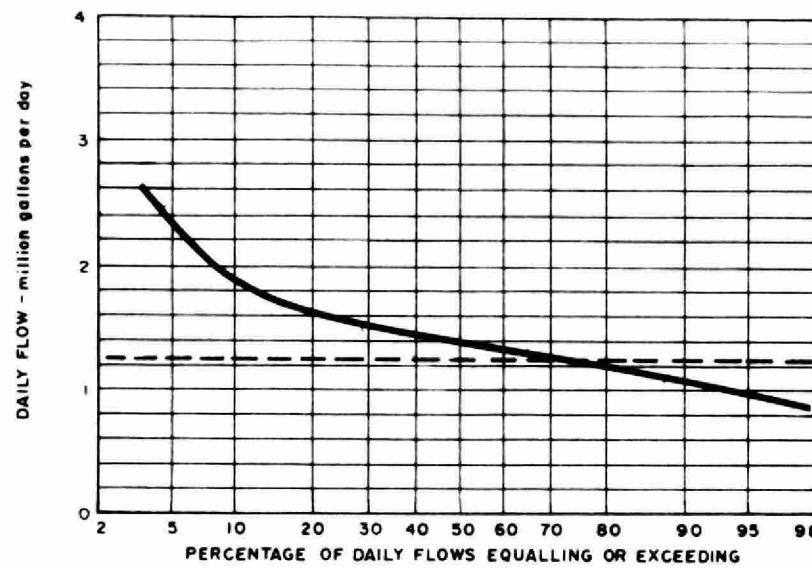
\* Sundry includes sludge haulage costs of \$3,019.50

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PROCESS DATA

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# FLOWS



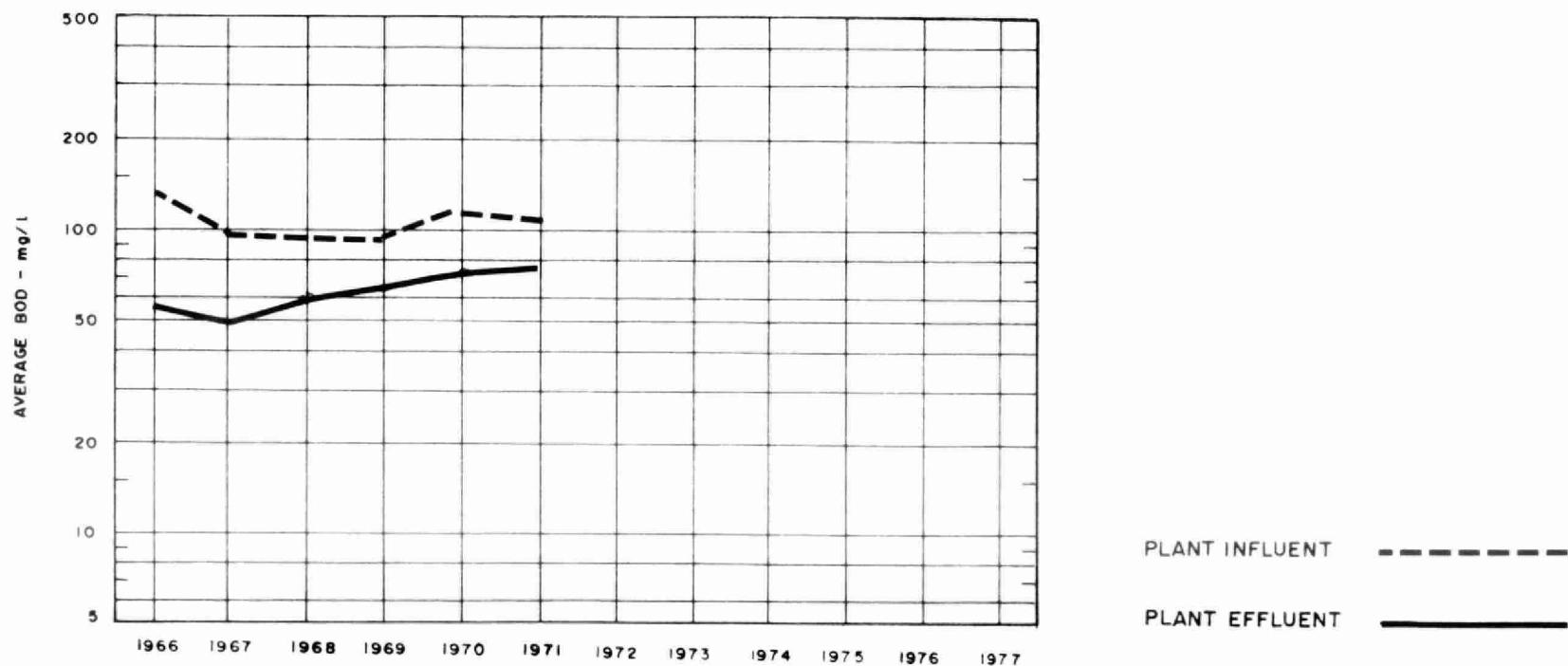
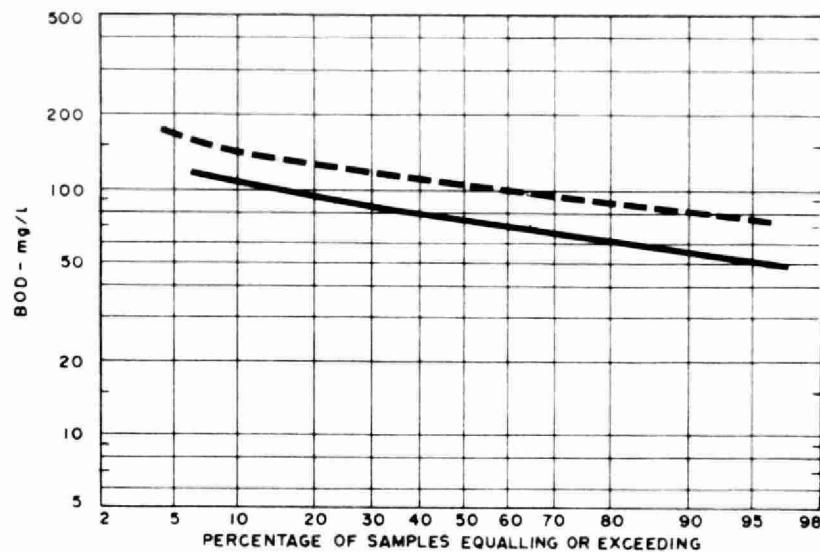
## PLANT PERFORMANCE

MONTH	FLOWS				BIOCHEMICAL OXYGEN DEMAND				SUSPENDED SOLIDS				TOTAL PHOSPHORUS			
	TOTAL FLOW		AVERAGE DAY	MAXIMUM DAY	MAXIMUM RATE	INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT	REDUCTION		INFLUENT	EFFLUENT	REDUCTION
	million gallons	mil gal	mil gal	mgd	mg/l	mg/l	%	10 <sup>3</sup> pounds	mg/l	mg/l	%	10 <sup>3</sup> pounds	mg/l as P	mg/l as P	%	
JAN	35.8	1.2	1.4	2.3	132	70	47	22.	180	85	53	34.	7.3	7.4	-	
FEB	35.6	1.3	2.0	3.6	92	82	11	4.	205	75	63	46.	11.8	7.2	39	
MAR	46.4	1.5	1.5	4.5	90	59	34	13.	230	70	70	74.	13.0	8.3	36	
APR	52.5 a	2.6	4.1	5.1	80	65	19	8.	150	60	60	47.	13.4	7.7	43	
MAY	o/s	-	-	-	97	55	44	-	183	90	51	-	20.0	11.4	43	
JUNE	31.3 b	1.4	1.7	5.1	115	97	15	6.	223	48	78	54.	18.0	11.2	38	
JULY	39.5	1.3	1.9	4.9	130	75	42	22.	175	65	63	43.	11.3	5.8	49	
AUG	48.8	1.3	1.7	4.9	110	55	50	27.	150	60	60	44.	13.0	12.0	77	
SEPT	70.8	1.4	1.7	4.2	110	77	30	13.	230	55	76	71.	18.5	10.9	41	
OCT	45.1	1.5	1.7	4.8	110	75	32	16.	180	60	67	54.	12.5	10.8	14	
NOV	42.7	1.4	1.7	4.5	110	90	18	9.	190	60	68	55.	18.0	13.5	25	
DEC	45.2	1.5	2.5	4.7	90	80	11	4.	220	50	77	77.	27.0	9.4	65	
TOTAL	511. est	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
AVG.	-	1.4	4.1	5.1	106	74	30	13.	193	66	66	54.	16.1	9.7	40	
No. of Samples	-	-	-	-	22	22	-	-	22	22	-	-	22	21	-	

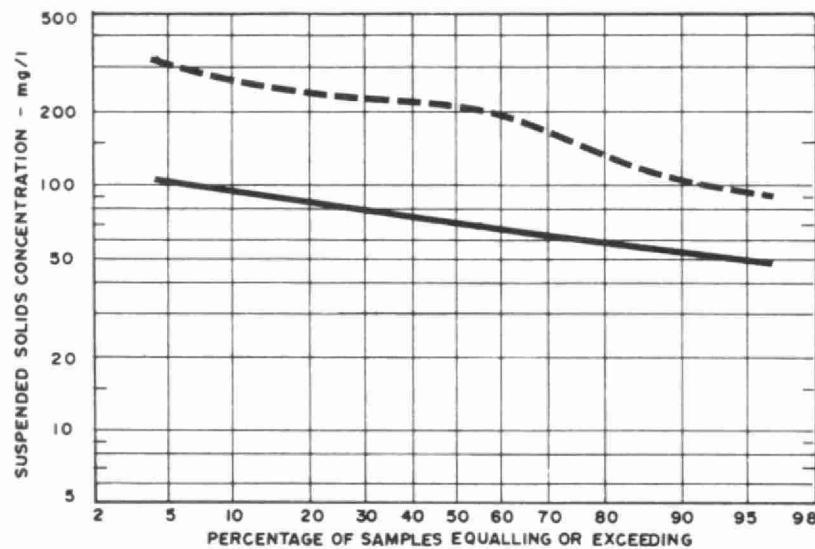
a - 20 day's flow data

b - 23 day's flow data

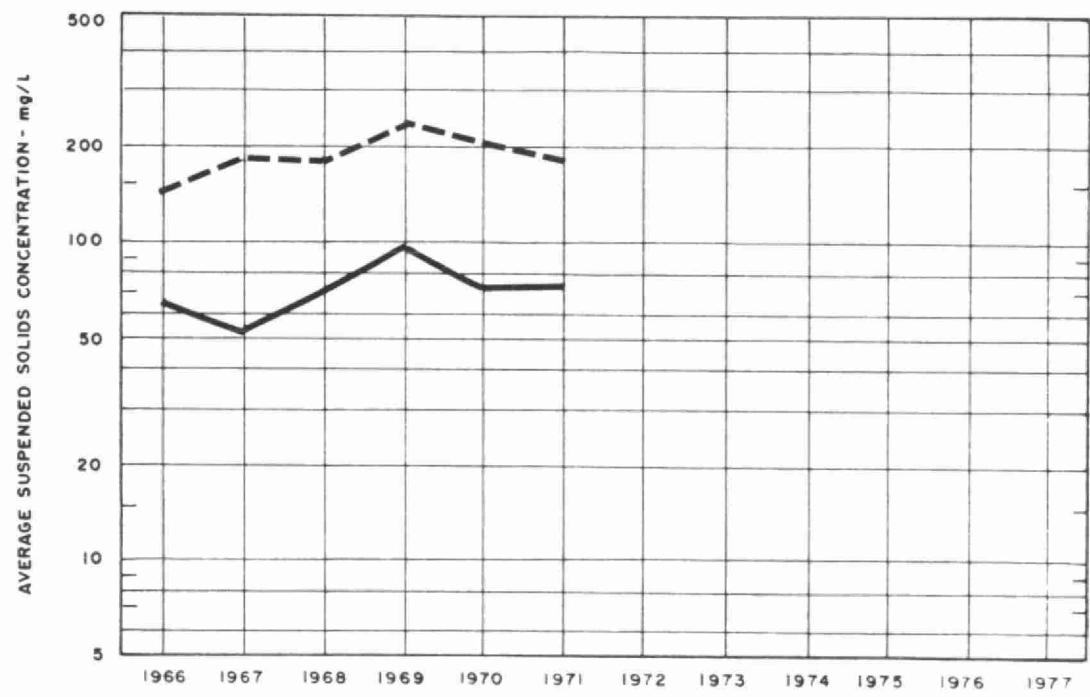
# BIOCHEMICAL OXYGEN DEMAND



# SUSPENDED SOLIDS



PLANT INFLUENT      ——  
PLANT EFFLUENT      —

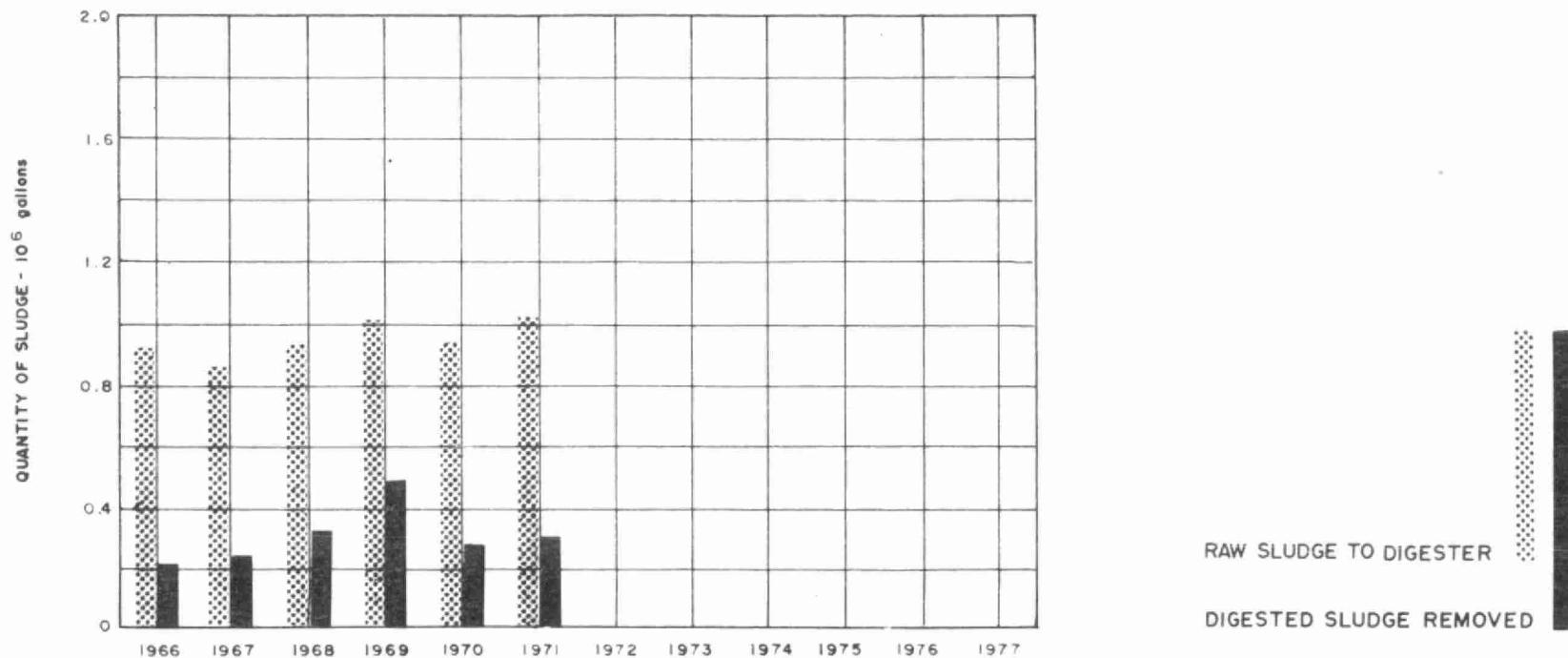
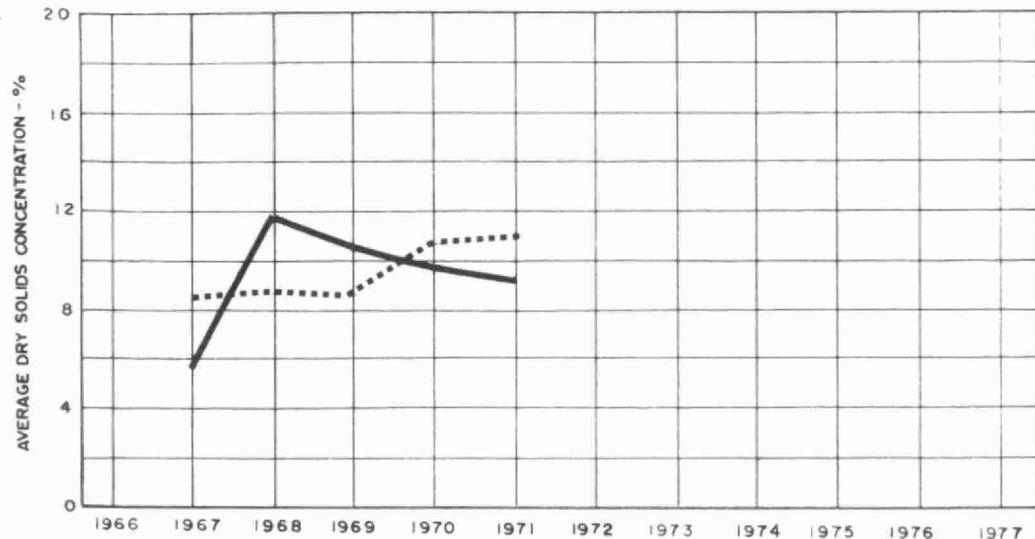


## TREATMENT DATA

MONTH	GRIT QUANTITY REMOVED cubic feet	CHLORINATION		SLUDGE DIGESTION and DISPOSAL							
		CHLORINE USED $10^3$ pounds	AVERAGE DOSAGE mg/l	RAW SLUDGE			DIGESTED SLUDGE			SUPERNATANT TOTAL SOLIDS %	SLUDGE HAULED cubic yards
				QUANTITY $10^3$ gallons	TOTAL SOLIDS %	VOLATILE SOLIDS %	QUANTITY REMOVED $10^3$ gallons	TOTAL SOLIDS %	VOLATILE SOLIDS %		
JAN	15	2.1	5.9	73.	12.4	47	12.	9.5	29	-	72
FEB	18	2.2	6.1	64.	12.0	56	21.	10.6	32	3.3	126
MAR	51	3.0	6.5	87.	10.1	36	36.	8.5	33	-	210
APR	69	3.1	3.9	90.	18.4	34	32.	9.9	30	.5	186
MAY	18	2.6	-	90.	11.2	53	30.	9.3	31	3.2	180
JUNE	46	2.8	7.3	98.	12.1	40	26.	10.2	29	.3	156
JULY	93	2.4	6.1	104.	6.9	48	32.	14.0	30	.3	161
AUG	53	3.1	6.3	98.	18.2	34	20.	10.8	36	-	205
SEPT	32	3.0	7.3	111.	17.3	45	30.	7.6	34	-	180
OCT	30	3.2	7.0	93.	7.7	51	25.	6.5	-	-	150
NOV	25	3.1	7.3	100.	9.4	43	19.	6.7	36	4.0	114
DEC	31	3.0	6.7	113.	5.4	36	24.	7.7	-	-	144
<b>TOTAL</b>	<b>481</b>	<b>33.6</b>	<b>-</b>	<b>1121.</b>	<b>-</b>	<b>-</b>	<b>307.</b>	<b>-</b>	<b>-</b>	<b>-</b>	<b>1884</b>
<b>AVG.</b>	<b>.94 cubic feet/mil gal</b>	<b>2.8</b>	<b>6.7</b>	<b>93.</b>	<b>11.7</b>	<b>43</b>	<b>25.</b>	<b>9.3</b>	<b>32</b>	<b>1.9</b>	<b>157</b>

# DIGESTION

RAW SLUDGE .....  
DIGESTED SLUDGE —————



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